Exercise **1** *When studying trigonometry, you will learn that both* sin *and* cos *are periodic functions with period* 2π. *This means that for all inputs* x, $\sin(x + 2\pi) = \sin(x)$ *and* $\cos(x + 2\pi) = \cos(x)$.

(a) *Consider the function* f *defined by* $f(x) = 2\sin(x)$. f *is*

  Multiple Choice:

   (i) *not periodic.*
   (ii) *periodic with period* π.
   (iii) *periodic with period* 2π. ✓
   (iv) *periodic with period* 3π.
   (v) *periodic with period* 4π.

(b) *Consider the function* g *defined by* $g(x) = \cos(x + 5)$. g *is*

  Multiple Choice:

   (i) *not periodic.*
   (ii) *periodic with period* π.
   (iii) *periodic with period* 2π. ✓
   (iv) *periodic with period* 3π.
   (v) *periodic with period* 4π.

(c) *Consider the function* h *defined by* $h(x) = \sin(x) + 2\cos(x)$. h *is*

  Multiple Choice:

   (i) *not periodic.*
   (ii) *periodic with period* π.
   (iii) *periodic with period* 2π. ✓
   (iv) *periodic with period* 3π.
   (v) *periodic with period* 4π.